Additional information on context for the DIATOMIC India Accelerator.

WHY INDIA?

India's trajectory toward sustainable cities and renewable energy innovations is not just a national priority but a global imperative. As the third-largest producer of renewable energy in the world, India is already at the forefront of a clean energy revolution. With an ambitious target to generate 500 GW of energy from renewables by 2030, the country is poised to integrate innovative technologies at an unprecedented pace. This commitment to renewable energy and sustainability is further amplified by India's rapid urbanisation, with projections indicating that 40% of the population will reside in cities by 2030. This urban shift necessitates the development of smart and sustainable cities to manage the increasing population density and resource demands.

In addition, India serves as a significant market for the UK, fostering ongoing bilateral research and development, incubation, and innovation efforts. These activities contribute to a long-term relationship that facilitates UK businesses in connecting with partners and collaborators, supporting their growth and scalability.

WHY INNOVATION?

CPC assess that three of the most pressing problems for the Indian environment- air pollution, water pollution and waste management – can be tackled effectively through the activity of SMEs operating in the Clean Tech sector. This, combined with India’s commitment to technological advancement and a robust start-up ecosystem, positions it as a global leader in sustainable development.

WHY THE CHALLENGES?

Future of Energy

While the country’s energy demand is rising rapidly due to urbanisation, industrialisation, and population growth, fossil fuels dominate the energy mix - leading to air pollution, greenhouse gas emissions and climate change. Moreover, India imports a significant portion of its oil and gas, making it vulnerable to price fluctuations and geopolitical tensions.

India's renewable energy potential is vast, supported by ample solar, wind, and hydro resources. The country's strategic geographical location provides an excellent environment for solar and wind power generation. Additionally, the government's proactive policies and incentives have led to significant investments and advancements in this sector and there is a focus on strengthening international cooperation and partnerships to share best practices, technologies, and financing for the energy sector.

By setting a target to generate 500 GW of renewable energy by 2030, India is not only addressing its energy security concerns but also contributing significantly to global climate goals. This ambitious target opens opportunities for innovations in energy storage, grid management, and sustainable urban planning.

Prioritising the development of sustainable energy solutions, India ensures environmental protection, economic resilience, and equitable energy access for its population.

Future of Mobility

Sustainable mobility is crucial for India due to several compelling reasons. By 2050, around 60% of India's population will reside in cities (*Mint*), generating a significant need for a robust, efficient, and clean urban mobility infrastructure to accommodate this urbanisation. Moreover, India's transport sector contributes 13.5% of energy-related emissions, with road transport accounting for 90% of energy consumption (*WRI India*), making the transition to alternative fuel vehicles and electric vehicles (EVs) vital for decarbonisation. Recognising the importance of such challenges, the Government is currently focusing on initiatives such as "The National Mission on Transformative Mobility and Battery Storage" and "The PLI Scheme for Advanced Chemistry Cell (ACC) Battery Storage" (*Invest India*).

Cooling technologies play a crucial role in India for several reasons. Steadily increasing temperatures are causing the demand for cooling systems to rise significantly. Implementing sustainable cooling strategies can lower carbon emissions, while also improving India's long-term food security and public health security through reliable cold chain networks. In particular, the Indian cold chain market is forecasted to grow (from INR 1,81,490 Cr in 2022 to INR 3,79,870 Cr in 2028, growing at a CAGR of 12.3% - *Invest India*), also thanks to initiatives promoted by the Government (such as *Pradhan Mantri Kisan Sampada Yojana - PMKSY*), specifically for cold chains infrastructures (*Financial Express Healthcare*).

Sustainable Urban Areas

The rapid urbanisation in India is a double-edged sword. While it presents challenges like overburdened infrastructure, pollution, and resource scarcity, it also provides an opportunity to reimagine urban living through smart city initiatives. The Smart Cities Mission, launched by the Indian government in 2015 and which covers up to 500 cities in India, aims to promote sustainable and inclusive cities that provide core infrastructure and a decent quality of life to their citizens. The focus is on sustainable development, efficient resource use, and leveraging technology to create smart outcomes for citizens. This mission aligns with the broader goal of developing sustainable cities that are resilient, energy-efficient, and liveable.

As the focus intensifies on how to improve air and water quality and manage waste effectively, there is an urgent need for innovative technologies to support the government's aims.